

Aviation

Course Code: 20053

Rational Statement:

Beginning with an overview of aviation, the course covers basic and advanced aerodynamics, navigation, safety, weather, aircraft performance, flight planning, introduction to aircraft systems, and FAA regulations.

Suggested Grade Level: 10-12

Topics Covered:

- History of Flight
- Principles of Flight
- Flight Environment
- Aircraft Systems and Performance
- Weather
- Navigation (Basic and Radio)
- Aviation Physiology
- Aerospace
- Career Possibilities

Core Technical Standards & Examples

Indicator 1: Identify events in the history of flight	
Bloom's Taxonomy Level	Standard and Example
Understanding	AV1.1 Identify flight in the ancient world Examples: <ul style="list-style-type: none"> • Identify the history of flight in Greek Myths • Identify the importance of Kites and Balloons in China during the third century
Understanding	AV1.2 Identify the development of flight in the early 1900s Examples: <ul style="list-style-type: none"> • Distinguish the difference between lighter-than-air and heavier-than-air • Identify the importance of blimps • Identify the importance of the Wright brothers
Understanding	AV1.3 identify the development of flight during the Golden Age of Flight (1918 to 1939) Examples: <ul style="list-style-type: none"> • Identify the importance of Charles Lindbergh. • Identify the importance of the Airmail Act (Kelly Act of 1925).
Understanding	AV1.4 Identify the development of flight innovation during World War II. (1939 to 1945) Examples: <ul style="list-style-type: none"> • Identify the importance of the V-2 rocket. • Identify the importance of early jets.
Understanding	AV1.5 Identify the development of flight innovation during the Cold War (1945 to 1991) Examples: <ul style="list-style-type: none"> • Identify the importance of commercial aviation • Identify the importance of space Flight
Understanding	AV1.6 Identify the development of flight innovation (1991 to present) Examples: <ul style="list-style-type: none"> • Identify the importance of subsonic military aviation • Identify the importance of unmanned aircraft

Indicator 2: Investigate the principles of flight	
Bloom's Taxonomy Level	Standard and Example
Evaluating	AV2.1 Investigate the basic parts and control surfaces Examples: <ul style="list-style-type: none"> • Examine the utilization of the airfoil • Examine the utilization of the wings • Examine the utilization of the tail • Examine the utilization of the propeller
Analyzing	AV2.2 Investigate the four forces of flight Examples: <ul style="list-style-type: none"> • Explore the concept of lift versus weight • Explore the concept of thrust versus drag
Evaluating	AV2.3 Investigate basic aerodynamics Examples: <ul style="list-style-type: none"> • Explore the concept of Newton's Three Laws of Motion • Explore the concept of Bernoulli effect • Explore the concept of Venturi effect • Explore the concept of Static versus Dynamic Pressure
Understanding	AV2.4 Investigate airplane stability Examples: <ul style="list-style-type: none"> • Explore the concept of Pitch • Explore the concept of Roll • Explore the concept of Yaw

Indicator 3: Understand the flight environment	
Bloom's Taxonomy Level	Standard and Example
Understanding	AV3.1 Understand air safety Examples: <ul style="list-style-type: none"> • List the types of air safety concerns • Demonstrate an understanding of the Federal Aeronautics Administration (FAA) regulations
Understanding	AV3.2 Understand the airport layout Examples: <ul style="list-style-type: none"> • List the types of airports • List the types of runway accidents
Understanding	AV3.3 Understand airspace control. Examples: <ul style="list-style-type: none"> • Complete a flight plan. • Comprehend air-traffic control procedures
Understanding	AV 3.4 Understand radio communications Examples: <ul style="list-style-type: none"> • Comprehend the language of radio communication in the air • Comprehend how two way radios work

Indicator 4: Understand aircraft systems and performance	
Bloom's Taxonomy Level	Standard and Example
Understanding	AV4.1 Understand basic aircraft instruments Examples: <ul style="list-style-type: none"> • Identify the six basic aircraft instruments • Interpret the reading of each instrument to confirm an accurate 'instrument scan'
Understanding	AV4.2 Understand aircraft systems Examples: <ul style="list-style-type: none"> • List the basic flight control systems (mechanical, hydro mechanical and fly-by-wire) • Describe the latest innovations in fly-by-wire flight control systems (Fly-by-optics, power-by-wire, and intelligent flight control systems)
Understanding	AV4.3 Understand aircraft performance Examples: <ul style="list-style-type: none"> • Solve percentage problems • Solve ratio and proportion problems to include compression ratio of an aircraft engine
Understanding	AV 4.4 Calculate weight and balance Examples: <ul style="list-style-type: none"> • Compute empty weight center of gravity on an aircraft • Compute loaded weight and loaded weight center of gravity of an aircraft

Indicator 5: Understand weather and flight	
Bloom's Taxonomy Level	Standard and Example
Understanding	AV5.1 Understand basic weather theory Examples: <ul style="list-style-type: none"> • Explain the composition of the Earth's atmosphere • Explain how temperature variation influences flight performance
Understanding	AV5.2 Weather patterns and clouds Examples: <ul style="list-style-type: none"> • Analyze pressure systems at different attitudes on a surface map • Identify the types of clouds (stratus, cumulonimbus, and cirrus) at different elevations and the potential hazards that may exist
Understanding	AV5.3 Weather hazards Examples: <ul style="list-style-type: none"> • Compare and contrast the common weather hazards when flying. • Identify safe and corrective actions for common weather hazards as suggested by the FAA.
Understanding	AV5.4 Interpret weather data Examples: <ul style="list-style-type: none"> • Interpret current weather condition using a weather map • Collect and analyze local weather data
Understanding	AV5.5 Sources of weather information Examples: <ul style="list-style-type: none"> • Understand SIGMET (Significant Meteorological Information) service • Define the role of the ADDS (Aviation Data Service)

Indicator 6: Understand navigation in aviation	
Bloom's Taxonomy Level	Standard and Example
Understanding	AV6.1. Understand Basic Navigation Examples: <ul style="list-style-type: none"> • List and describe the essential information a pilot needs to know. (Starting point, Ending point, Direction, Distance, Speed, Fuel Capacity, and Weight and Balance) • List the advantages and disadvantages of VFR (Visual Flight Rules) flying
Understanding	AV6.2 Understand Dead Reckoning Examples: <ul style="list-style-type: none"> • Define Dead Reckoning • Calculate a flight course using the elements of course line, airspeed, course heading and elapsed time
Understanding	AV6.3 Utilize a Flight Computer Examples: <ul style="list-style-type: none"> • Understand the basic concepts of a flight computer • Use a flight computer to file a flight plan
Understanding	AV6.4 Understand Aeronautical Charts Examples: <ul style="list-style-type: none"> • Plot a course using an Aeronautical Chart • Evaluate flight plans for improved efficiency
Understanding	AV6.5 Comprehend Radio Navigation Examples: <ul style="list-style-type: none"> • List the types of Radio Navigation (Automatic Direction Finder (ADF), Very High Frequency Omni-directional Range (VOR), Distance Measuring Equipment (DME), Instrument Landing System (ILS) and LORAN-C) • Compare and contrast the types of Radio Navigation

Indicator 7: Understand Aviation Physiology.	
Bloom's Taxonomy Level	Standard and Example
Understanding	AV7.1 Know the effect on the body in the flight environment Examples: <ul style="list-style-type: none"> • Identify the potential hazards on the body during flight • List and describe the safety procedures to prevent aviation accidents

Indicator 8: Understand aerospace concepts	
Bloom's Taxonomy Level	Standard and Example
Understanding	AV8.1 Know the nature and characteristics of space Examples: <ul style="list-style-type: none"> • Comprehend the basic science of space • Understand key terms used in space science
Understanding	AV8.2 Comprehend our knowledge of the Universe Examples: <ul style="list-style-type: none"> • Understand how our knowledge of the universe has developed over time • Define key innovations that will contribute to our knowledge of the Universe
Understanding	AV8.3 Understand basic rocket theory and space flight Examples: <ul style="list-style-type: none"> • Know the history of rocketry • Comprehend the development of space flight
Understanding	AV8.4 Analyze the Space Shuttle program Examples: <ul style="list-style-type: none"> • Understand the significance of the Space Shuttle • Analyze the contributions made by the Space Shuttle program
Understanding	AV8.5 Analyze the International Space Station Examples: <ul style="list-style-type: none"> • List the stages of development with the International Space Station • Analyze the impact the space station will have on future space travel

Understanding	AV8.6 Hubble Space Telescope Examples: <ul style="list-style-type: none"> • Comprehend the development of the Hubble Space Telescope • Predict the future of the Hubble Space Telescope program
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Indicator 9: Careers in Aviation.	
Bloom's Taxonomy Level	Standard and Example
Understanding	AV9.1 Summarize aviation career fields and occupations Examples: <ul style="list-style-type: none"> • Research career opportunities that best meet their interests by participating in career exploration activities • Interview a professional working in an occupation that is of interest to them • Explore the requirements, skills, wages, education, and geographic opportunities in one career of each pathway in this career cluster